AMENDMENTS TO THE CLAIMS

Please substitute the following pending claims 1-183 and 186-191 as replacement claims for the previously-pending claims. In this Amendment C, claims 1, 2, 7, 15-21, 25-29, 34, 37, 56, 61, 117, 129, 141, 157, 169, 175, 177, 178 and 181-183 have been amended, claims 184 and 185 have been canceled, and new claim 191 has been added.

1. **(currently amended)** A parallel flow reaction system for effecting four or more simultaneous reactions in four or more reaction channels, the reaction system comprising

four or more reactors, each of the four or more reactors comprising a surface defining a reaction cavity for carrying out a chemical reaction, an inlet port in fluid communication with the reaction cavity, and an outlet port in fluid communication with the reaction cavity,

a fluid distribution system for simultaneously supplying one or more reactants from one or more reactant sources to the inlet port of the reaction cavity for each of the four or more reactors, and for discharging a reactor effluent from the outlet port of each such reaction cavity to one or more effluent sinks, the fluid distribution system comprising one or more subsystems selected from the group consisting of

(a) a flow-partitioning subsystem for providing a different flow rate to each of the four or more reactors, the flow-partitioning subsystem comprising at least one set of four or more passive flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set,

(b) a pressure-partitioning subsystem for providing a different reaction pressure in the reaction cavity of each of the four or more reactors, the pressure-partitioning subsystem comprising at least one set of four or more passive flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set, and

(c) a feed-composition subsystem for providing a different feed composition to each of the four or more reactors, the feed-composition subsystem ~~one or more subsystems~~ comprising four or more mixing zones and at least one set of four or more passive flow restrictors, each of the four or more flow restrictors providing a resistance to flow between the one or more reactant sources and one of the four or more mixing zones, each of the four

or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set.

2. **(currently amended)** A parallel flow reaction system for effecting four or more simultaneous reactions in four or more reaction channels, the reaction system comprising

four or more reactors, each of the four or more reactors comprising a surface defining a reaction cavity having a volume of not more than about 100 ml for carrying out a chemical reaction, an inlet port in fluid communication with the reaction cavity, and an outlet port in fluid communication with the reaction cavity, and

a fluid distribution system for simultaneously supplying one or more reactants from one or more reactant sources to the inlet port of the reaction cavity for each of the four or more reactors, and for discharging a reactor effluent from the outlet port of each such reaction cavity to one or more effluent sinks, the fluid distribution system comprising one or more subsystems selected from the group consisting of

(a) a flow-partitioning subsystem having operational capability for providing a different flow rate to each of the four or more reactors, the flow-partitioning subsystem comprising at least one set of four or more flow restrictors integral with a substrate or with one or more microchip bodies mounted on a substrate,

(b) a pressure-partitioning subsystem having operational capability for providing a different reaction pressure in the reaction cavity of each of the four or more reactors, the pressure-partitioning subsystem comprising at least one set of four or more flow restrictors integral with a substrate or with one or more microchip bodies mounted on a substrate, and

(c) a feed-composition subsystem having operational capability for providing a different feed composition to each of the four or more reactors, the feed-composition subsystem comprising four or more mixing zones and at least one set of four or more flow restrictors, each of the four or more flow restrictors providing a resistance to flow between the one or more reactant sources and one of the four or more mixing zones, the four or more flow restrictors being integral with a substrate or with one or more microchip bodies mounted on a substrate.

3. **(original)** The reaction system of claim 1 or 2 further comprising a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

4. **(original)** The reaction systems of claims 1 or 2 wherein the fluid distribution system further comprises a set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance that varies relative to other inlet flow restrictors in the set.

5. **(original)** The reaction systems of claims 1 or 2 wherein the fluid distribution system comprises a set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance that varies relative to other outlet flow restrictors in the set.

6. **(original)** The reaction systems of claims 1 or 2 wherein the fluid distribution system further comprises

a first set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance that varies relative to other inlet flow restrictors in the set, and

a second set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance that varies relative to other outlet flow restrictors in the set.

7. **(currently amended)** A parallel flow ~~The~~ reaction system ~~of claim 1~~ for effecting four or more simultaneous reactions in four or more reaction channels, the reaction system comprising ~~the~~

four or more reactors, each of the four or more reactors comprising a surface defining a reaction cavity for carrying out a chemical reaction, an inlet port in fluid communication with the reaction cavity, and an outlet port in fluid communication with the reaction cavity, and

a fluid distribution system for simultaneously supplying one or more reactants from one or more reactant sources to the inlet port of the reaction cavity for each of the four or more reactors, and for discharging a reactor effluent from the outlet port of each such reaction cavity to one or more effluent sinks, the fluid distribution system comprising a flow-partitioning subsystem for providing a different flow rate to each of the four or more reactors, the flow-partitioning subsystem comprising at least one set of four or more passive flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set.

8. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem and the pressure-partitioning subsystem.

9. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem and the feed-composition subsystem.

10. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

11. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem, the pressure-partitioning subsystem and the feed-composition subsystem.

12. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem, the pressure-partitioning subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

13. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem, the feed-composition subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

14. **(original)** The reaction system of claim 1 comprising the flow-partitioning subsystem, the pressure-partitioning subsystem, the feed-composition subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

15. **(currently amended)** The reaction system ~~systems~~ of claim 7 wherein the flow-partitioning subsystem comprises a set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance that varies relative to other inlet flow restrictors in the set.

16. **(currently amended)** The reaction system ~~systems~~ of claim 7wherein the flow-partitioning subsystem comprises a set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance that varies relative to other outlet flow restrictors in the set.

17. **(currently amended)** The reaction system ~~systems~~ of claim 7 wherein the flow-partitioning subsystem comprises

a first set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance that varies relative to other inlet flow restrictors in the set, and

a second set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance that varies relative to other outlet flow restrictors in the set.

18. **(currently amended)** The reaction system ~~systems~~ of ~~any of~~ claim 7 wherein the fluid distribution system provides a different flowrate through each of the four or more reactors, while maintaining substantially the same pressure in the reaction cavity of each of the four or more reactors.

19. **(currently amended)** The reaction system ~~systems~~ of claim 18 wherein the flow-partitioning subsystem comprises

a first set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance, R_{inlet}, that varies relative to other inlet flow restrictors in the set, and

a second set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance, R_{outlet}, that varies relative to other outlet flow restrictors in the set,

the total resistance of the inlet and outlet flow restrictors for each channel, $R_{total} = R_{inlet} + R_{outlet}$, varying between each of the four or more channels of the reaction system to provide a different flowrate through each of the four or more reactors, and the ratio of the resistances of the inlet and outlet flow restrictors for each channel, $R_{inlet} : R_{outlet}$, being substantially the same between each of the four or more channels of the reaction system to provide substantially the same pressure in the reaction cavities of each of the four or more reactors.

20. **(currently amended)** The reaction system ~~systems~~ of claim 8 wherein the flow-partitioning subsystem and the pressure-partitioning subsystem are integrated and comprise

a first set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance, R_{inlet}, that varies relative to other inlet flow restrictors in the set, and

a second set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance, R_{outlet}, that varies relative to other outlet flow restrictors in the set,

the total resistance of the inlet and outlet flow restrictors for each channel, $R_{total} = R_{inlet} + R_{outlet}$, varying between each of the four or more channels of the reaction system to provide different flow rates through each of the four or more reactors, and the ratio of the resistances of the inlet and outlet flow restrictors for each channel, $R_{inlet} : R_{outlet}$, varying between each of the four or more channels of the reaction system to provide a different pressure in the reaction cavities of each of the four or more reactors.

21. **(currently amended)** A parallel flow ~~The~~ reaction system ~~of claim 1~~ for effecting four or more simultaneous reactions in four or more reaction channels, the reaction system comprising ~~the~~

four or more reactors, each of the four or more reactors comprising a surface defining a reaction cavity for carrying out a chemical reaction, an inlet port in fluid communication with the reaction cavity, and an outlet port in fluid communication with the reaction cavity, and

a fluid distribution system for simultaneously supplying one or more reactants from one or more reactant sources to the inlet port of the reaction cavity for each of the four or more reactors, and for discharging a reactor effluent from the outlet port of each such reaction cavity to one or more effluent sinks, the fluid distribution system comprising a pressure-partitioning subsystem for providing a different reaction pressure in the reaction cavity of

each of the four or more reactors, the pressure-partitioning subsystem comprising at least one set of four or more passive flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set.

22. **(original)** The reaction system of claim 1 comprising the pressure-partitioning subsystem and the feed-composition subsystem.

23. **(original)** The reaction system of claim 1 comprising the pressure-partitioning subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

24. **(original)** The reaction system of claim 1 comprising the pressure-partitioning subsystem, the feed-composition subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

25. **(currently amended)** The reaction system ~~systems~~ of claim 21 wherein the pressure-partitioning subsystem comprises a set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance that varies relative to other inlet flow restrictors in the set.

26. **(currently amended)** The reaction system ~~systems~~ of claim 21 wherein the pressure-partitioning subsystem comprises a set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance that varies relative to other outlet flow restrictors in the set.

27. **(currently amended)** The reaction system ~~systems~~ of claim 21 wherein the pressure-partitioning subsystem comprises

a first set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance that varies relative to other inlet flow restrictors in the set, and

a second set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance that varies relative to other outlet flow restrictors in the set.

28. **(currently amended)** The reaction system ~~systems~~ of claim ~~claims~~ 21 wherein the fluid distribution system provides a different reaction pressure in the reaction cavity of each of the four or more reactors, while maintaining substantially the same flow rate through each of the four or more reactors.

29. **(currently amended)** The reaction system ~~systems~~ of claim 28 wherein the pressure-partitioning subsystem comprises

a first set of four or more inlet flow restrictors, each of the four or more inlet flow restrictors providing fluid communication between at least one reactant source and one of the four or more reactors, each of the four or more inlet flow restrictors having a flow resistance, R_{inlet}, that varies relative to other inlet flow restrictors in the set, and

a second set of four or more outlet flow restrictors, each of the four or more outlet flow restrictors providing fluid communication between one of the four or more reactors and at least one effluent sink, each of the four or more outlet flow restrictors having a flow resistance, R_{outlet}, that varies relative to other outlet flow restrictors in the set,

the total resistance of the inlet and outlet flow restrictors for each channel, $R_{total} = R_{inlet} + R_{outlet}$, being substantially the same between each of the four or more channels of the reaction system to provide substantially the same flow rates through each of the four or more reactors,

and the ratio of the resistances of the inlet and outlet flow restrictors for each channel, R_{inlet} : R_{outlet}, varying between each of the four or more channels of the reaction system to provide a different pressure in the reaction cavities of each of the four or more reactors.

30. **(original)** The reaction system of claim 1 comprising the feed-composition subsystem.

31. **(original)** The reaction system of claim 1 comprising the feed-composition subsystem and a temperature-control subsystem having operational capability for providing a different reaction temperature in the reaction cavity of each of the four or more reactors.

32. **(original)** The reaction system of claim 15 wherein the set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

33. **(original)** The reaction system of claim 16 wherein the set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

34. **(currently amended)** The reaction system of claim 17 wherein

the set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and ;

the set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

35. **(original)** The reaction system of claim 25 wherein the set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

36. **(original)** The reaction system of claim 26 wherein the set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

37. **(amended)** The reaction system of claim 27 wherein

the set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and ~~.~~

the set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

38. **(original)** The reaction system of claim 15 wherein the flow restrictors are microfluidic channels.

39. **(original)** The reaction system of claim 16 wherein the flow restrictors are microfluidic channels.

40. **(original)** The reaction system of claim 17 wherein the flow restrictors are microfluidic channels.

41. **(original)** The reaction system of claim 19 wherein the flow restrictors are microfluidic channels.

42. **(original)** The reaction system of claim 20 wherein the flow restrictors are microfluidic channels.

43. **(original)** The reaction system of claim 25 wherein the flow restrictors are microfluidic channels.

44. **(original)** The reaction system of claim 26 wherein the flow restrictors are microfluidic channels.

45. **(original)** The reaction system of claim 27 wherein the flow restrictors are microfluidic channels.

46. **(original)** The reaction system of claim 29 wherein the flow restrictors are microfluidic channels.

47. **(original)** The reaction system of claim 15 wherein the flow restrictors are capillaries.

48. **(original)** The reaction system of claim 16 wherein the flow restrictors are capillaries.

49. **(original)** The reaction system of claim 17 wherein the flow restrictors are capillaries.

50. **(original)** The reaction system of claim 19 wherein the flow restrictors are capillaries.

51. **(original)** The reaction system of claim 20 wherein the flow restrictors are capillaries.

52. **(original)** The reaction system of claim 25 wherein the flow restrictors are capillaries.

53. **(original)** The reaction system of claim 26 wherein the flow restrictors are capillaries.

54. **(original)** The reaction system of claim 27 wherein the flow restrictors are capillaries.

55. **(original)** The reaction system of claim 29 wherein the flow restrictors are capillaries.

56. **(currently amended)** The reaction system of claim 15 wherein the flow resistance of each of the four or more inlet flow restrictors varies relative to other inlet flow restrictors in the set by a common factor. ~~factor,~~

57. **(original)** The reaction system of claim 16 wherein the flow resistance of each of the four or more outlet flow restrictors varies relative to other outlet flow restrictors in the set by a common factor.

58. **(original)** The reaction system of claim 17 wherein the flow resistance of each of the four or more inlet flow restrictors varies relative to other inlet flow restrictors in the set by a factor of two, and the flow resistance of each of the four or more outlet flow restrictors varies relative to other outlet flow restrictors in the set by a factor of two.

59. **(original)** The reaction system of claim 19 wherein the flow resistance of each of the four or more inlet flow restrictors varies relative to other inlet flow restrictors in the set by a common factor, and the flow resistance of each of the four or more outlet flow restrictors varies relative to other outlet flow restrictors in the set by a common factor.

60. **(original)** The reaction system of claim 20 wherein the flow resistance of each of the four or more inlet flow restrictors varies relative to other inlet flow restrictors in the set by a common factor, and the flow resistance of each of the four or more outlet flow restrictors varies relative to other outlet flow restrictors in the set by a common factor.

61. **(currently amended)** The reaction system of claim 25 wherein the flow resistance of each of the four or more inlet flow restrictors varies relative to other inlet flow restrictors in the set by a common factor. ~~factor,~~

62. **(original)** The reaction system of claim 26 wherein the flow resistance of each of the four or more outlet flow restrictors varies relative to other outlet flow restrictors in the set by a common factor.

63. **(original)** The reaction system of claim 27 wherein the flow resistance of each of the four or more inlet flow restrictors varies relative to other inlet flow restrictors in the set by a factor of two, and the flow resistance of each of the four or more outlet flow restrictors varies relative to other outlet flow restrictors in the set by a factor of two.

64. **(original)** The reaction system of claim 15 wherein the flow-partitioning subsystem comprises

a first plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a first reactor of the four or more reactors,

a second plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a second reactor of the four or more reactors,

a third plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a third reactor of the four or more reactors, and

a fourth plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a fourth reactor of the four or more reactors,

such that the set of four or more inlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors.

65. **(original)** The reaction system of claim 64 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

66. **(original)** The reaction system of claim 64 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

67. **(original)** The reaction system of claim 64 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

68. **(original)** The reaction system of claim 16 wherein the flow-partitioning subsystem comprises

a first plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a first reactor of the four or more reactors and the at least one effluent sink,

a second plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a second reactor of the four or more reactors and the at least one effluent sink,

a third plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a third reactor of the four or more reactors and the at least one effluent sink, and

a fourth plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a fourth reactor of the four or more reactors and the at least one effluent sink,

such that the set of four or more outlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors.

69. **(original)** The reaction system of claim 68 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

70. **(original)** The reaction system of claim 68 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

71. **(original)** The reaction system of claim 68 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies detachably mounted on the substrate.

72. **(original)** The reaction system of claim 17 wherein the flow-partitioning subsystem comprises

a first plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a first reactor of the four or more reactors,

a second plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a second reactor of the four or more reactors,

a third plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a third reactor of the four or more reactors, and

a fourth plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a fourth reactor of the four or more reactors,

such that the set of four or more inlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors, and further,

a first plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the first reactor and the at least one effluent sink,

a second plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the second reactor and the at least one effluent sink,

a third plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the third reactor and the at least one effluent sink, and

a fourth plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the fourth reactor and the at least one effluent sink,

such that the set of four or more outlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors.

73. **(original)** The reaction system of claim 72 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on the substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

74. **(original)** The reaction system of claim 72 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

75. **(original)** The reaction system of claim 72 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies detachably mounted on the substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies detachably mounted on the substrate.

76. **(original)** The reaction system of claim 25 wherein the pressure-partitioning subsystem comprises

a first plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a first reactor of the four or more reactors,

a second plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a second reactor of the four or more reactors,

a third plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a third reactor of the four or more reactors, and

a fourth plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a fourth reactor of the four or more reactors,

such that the set of four or more inlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors.

77. **(original)** The reaction system of claim 76 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

78. **(original)** The reaction system of claim 76 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

79. **(original)** The reaction system of claim 76 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

80. **(original)** The reaction system of claim 26 wherein the pressure-partitioning subsystem comprises

a first plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a first reactor of the four or more reactors and the at least one effluent sink,

a second plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a second reactor of the four or more reactors and the at least one effluent sink,

a third plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a third reactor of the four or more reactors and the at least one effluent sink, and

a fourth plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between a fourth reactor of the four or more reactors and the at least one effluent sink,

such that the set of four or more outlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors.

81. **(original)** The reaction system of claim 80 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

82. **(original)** The reaction system of claim 80 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

83. **(original)** The reaction system of claim 80 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

84. **(original)** The reaction system of claim 27 wherein the pressure-partitioning subsystem comprises

a first plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a first reactor of the four or more reactors,

a second plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a second reactor of the four or more reactors,

a third plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a third reactor of the four or more reactors, and

a fourth plurality of selectable dedicated inlet flow restrictors having different flow resistances, and providing selectable fluid communication between the at least one reactant source and a fourth reactor of the four or more reactors,

such that the set of four or more inlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors, and further,

a first plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the first reactor and the at least one effluent sink,

a second plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the second reactor and the at least one effluent sink,

a third plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the third reactor and the at least one effluent sink, and

a fourth plurality of selectable dedicated outlet flow restrictors having different flow resistances, and providing selectable fluid communication between the fourth reactor and the at least one effluent sink,

such that the set of four or more outlet flow restrictors can be selected to include at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors.

85. **(original)** The reaction system of claim 84 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

86. **(original)** The reaction system of claim 84 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

87. **(original)** The reaction system of claim 84 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

88. **(original)** The reaction system of claim 64 wherein the flow-partitioning subsystem further comprises four or more inlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors to form the set of four or more inlet flow restrictors.

89. **(original)** The reaction system of claim 68 wherein the flow-partitioning subsystem further comprises four or more outlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors to form the set of four or more outlet flow restrictors.

90. **(original)** The reaction system of claim 72 wherein the flow-partitioning subsystem further comprises

four or more inlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors to form the set of four or more inlet flow restrictors, and

four or more outlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors to form the set of four or more outlet flow restrictors.

91. **(original)** The reaction system of claim 76 wherein the pressure-partitioning subsystem further comprises four or more inlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors to form the set of four or more inlet flow restrictors.

92. **(original)** The reaction system of claim 80 wherein the pressure-partitioning subsystem further comprises four or more outlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors to form the set of four or more outlet flow restrictors.

93. **(original)** The reaction system of claim 84 wherein pressure-partitioning subsystem further comprises

four or more inlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors to form the set of four or more inlet flow restrictors, and

four or more outlet selection valves for selecting at least one flow restrictor from each of the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors to form the set of four or more outlet flow restrictors.

94. **(original)** The reaction system of claim 64 wherein the flow-partitioning subsystem further comprises a first plurality of inlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated inlet flow restrictors, a second plurality of inlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated inlet flow restrictors, a third plurality of inlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated inlet flow restrictors, and a fourth plurality of inlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated inlet flow restrictors.

95. **(original)** The reaction system of claim 94 wherein the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves of the inlet isolation valve array are integral with a substrate or with one or more microchip bodies mounted on the substrate.

96. **(original)** The reaction system of claim 94 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on the substrate.

97. **(original)** The reaction system of claim 94 wherein

the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

98. **(original)** The reaction system of claim 68 wherein the flow-partitioning subsystem further comprises a first plurality of outlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated outlet flow restrictors, a second plurality of outlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated outlet flow restrictors, a third plurality of outlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated outlet flow restrictors, and a fourth plurality of outlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated outlet flow restrictors.

99. **(original)** The reaction system of claim 98 wherein the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate.

100. **(original)** The reaction system of claim 98 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

101. **(original)** The reaction system of claim 98 wherein

the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on the substrate.

102. **(original)** The reaction system of claim 72 wherein the flow-partitioning subsystem further comprises

a first plurality of inlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated inlet flow restrictors, a second plurality of inlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated inlet flow restrictors, a thirds plurality of inlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated inlet flow restrictors, a fourth plurality of inlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated inlet flow restrictors, and

a first plurality of outlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated outlet flow restrictors, a second plurality of outlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated outlet flow restrictors, a third plurality of outlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated outlet flow restrictors, and a fourth plurality of outlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated outlet flow restrictors.

103. **(original)** The reaction system of claim 102 wherein

the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate.

104. **(original)** The reaction system of claim 102 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

105. **(original)** The reaction system of claim 102 wherein

the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

106. **(original)** The reaction system of claim 76 wherein the pressure-partitioning subsystem further comprises a first plurality of inlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated inlet flow restrictors, a second plurality of inlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated inlet flow restrictors, a third plurality of inlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated inlet flow restrictors, and a fourth plurality of inlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated inlet flow restrictors.

107. **(original)** The reaction system of claim 106 wherein the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate.

108. **(original)** The reaction system of claim 106 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

109. **(original)** The reaction system of claim 106 wherein

the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

110. **(original)** The reaction system of claim 80 wherein the pressure-partitioning subsystem further comprises a first plurality of outlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated outlet flow restrictors, a second plurality of outlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated outlet flow restrictors, a third plurality of outlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated outlet flow restrictors, and a fourth plurality of outlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated outlet flow restrictors.

111. **(original)** The reaction system of claim 110 wherein the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate.

112. **(original)** The reaction system of claim 110 wherein the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

113. **(original)** The reaction system of claim 110 wherein

the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

114. **(original)** The reaction system of claim 84 wherein pressure-partitioning subsystem further comprises

a first plurality of inlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated inlet flow restrictors, a second plurality of inlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated inlet flow restrictors, a thirds plurality of inlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated inlet flow restrictors, a fourth plurality of inlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated inlet flow restrictors, and

a first plurality of outlet isolation valves for selecting at least one flow restrictor from the first plurality of selectable dedicated outlet flow restrictors, a second plurality of outlet isolation valves for selecting at least one flow restrictor from the second plurality of selectable dedicated outlet flow restrictors, a third plurality of outlet isolation valves for selecting at least one flow restrictor from the third plurality of selectable dedicated outlet flow restrictors, and a fourth plurality of outlet isolation valves for selecting at least one flow restrictor from the fourth plurality of selectable dedicated outlet flow restrictors.

115. **(original)** The reaction system of claim 114 wherein

the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate.

116. **(original)** The reaction system of claim 114 wherein

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

117. **(currently amended)** The reaction system of claim 114 wherein

the first plurality of inlet isolation valves, the second plurality of inlet isolation valves, the third plurality of inlet isolation valves and the fourth plurality of inlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first plurality of outlet isolation valves, the second plurality of outlet isolation valves, the third plurality of outlet isolation valves and the fourth plurality of outlet isolation valves are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and ;

the first plurality, the second plurality, the third plurality and the fourth plurality of selectable dedicated outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

118. **(original)** The reaction system of claim 15 wherein the flow-partitioning subsystem comprises a series of selectable sets of inlet flow restrictors, the inlet-set series comprising

a first set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between at least one reactant source and first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the first set having a different flow resistance relative to each other, and

a second set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between the least one reactant source and the first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the second set having a different flow resistance

relative to each other, the flow resistance of at least one of the four or more inlet flow restrictors of the second set varying from the flow resistance of the corresponding inlet flow restrictor of the first set,

such that the first set or the second set of inlet flow restrictors can be selected to provide fluid communication between the at least one reactant source and the four or more reactors.

119. **(original)** The reaction system of claim 118 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

120. **(original)** The reaction system of claim 118 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

121. **(original)** The reaction system of claim 118 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

122. **(original)** The reaction system of claim 16 wherein the flow-partitioning subsystem comprises a series of selectable sets of outlet flow restrictors, the outlet-set series comprising

a first set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between first, second, third and fourth reactors, respectively, and at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the first set having a different flow resistance relative to each other, and

a second set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between the first, second, third and fourth reactors, respectively, an the at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the second set having a different flow resistance

relative to each other, the flow resistance of at least one of the four or more outlet flow restrictors of the second set varying from the flow resistance of the corresponding outlet flow restrictor of the first set,

such that the first set or the second set of outlet flow restrictors can be selected to provide fluid communication between the four or more reactors and the at least one effluent sink.

123. **(original)** The reaction system of claim 122 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

124. **(original)** The reaction system of claim 122 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

125. **(original)** The reaction system of claim 122 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

126. **(original)** The reaction system of claim 17 wherein the flow-partitioning subsystem comprises

a series of selectable sets of inlet flow restrictors, the inlet-set series comprising (a) a first set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between at least one reactant source and first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the first set having a different flow resistance relative to each other, and (b) a second set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between the least one reactant source and the first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the second set having a different flow resistance

relative to each other, the flow resistance of at least one of the four or more inlet flow restrictors of the second set varying from the flow resistance of the corresponding inlet flow restrictor of the first set, such that the first set or the second set of inlet flow restrictors can be selected to provide fluid communication between the at least one reactant source and the four or more reactors, and

a series of selectable sets of outlet flow restrictors, the outlet-set series comprising (a) a first set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between first, second, third and fourth reactors, respectively, and at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the first set having a different flow resistance relative to each other, and (b) a second set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between the first, second, third and fourth reactors, respectively, an the at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the second set having a different flow resistance relative to each other, the flow resistance of at least one of the four or more outlet flow restrictors of the second set varying from the flow resistance of the corresponding outlet flow restrictor of the first set, such that the first set or the second set of outlet flow restrictors can be selected to provide fluid communication between the four or more reactors and the at least one effluent sink.

127. **(original)** The reaction system of claim 126 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

128. **(original)** The reaction system of claim 126 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

129. **(currently amended)** The reaction system of claim 126 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate, and ;

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

130. **(original)** The reaction system of claim 25 wherein the pressure-partitioning subsystem comprises a series of selectable sets of inlet flow restrictors, the series comprising

a first set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between at least one reactant source and first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the first set having a different flow resistance relative to each other, and

a second set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between the least one reactant source and the first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the second set having a different flow resistance relative to each other, the flow resistance of at least one of the four or more inlet flow restrictors of the second set varying from the flow resistance of the corresponding inlet flow restrictor of the first set,

such that the first set or the second set of inlet flow restrictors can be selected to provide fluid communication between the at least one reactant source and the four or more reactors.

131. **(original)** The reaction system of claim 130 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

132. **(original)** The reaction system of claim 130 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

133. **(original)** The reaction system of claim 130 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

134. **(original)** The reaction system of claim 26 wherein the pressure-partitioning subsystem comprises a series of selectable sets of outlet flow restrictors, the series comprising

a first set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between first, second, third and fourth reactors, respectively, and at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the first set having a different flow resistance relative to each other, and

a second set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between the first, second, third and fourth reactors, respectively, an the at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the second set having a different flow resistance relative to each other, the flow resistance of at least one of the four or more outlet flow restrictors of the second set varying from the flow resistance of the corresponding outlet flow restrictor of the first set,

such that the first set or the second set of outlet flow restrictors can be selected to provide fluid communication between the four or more reactors and the at least one effluent sink

135. **(original)** The reaction system of claim 134 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

136. **(original)** The reaction system of claim 134 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

137. **(original)** The reaction system of claim 134 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies detachably mounted on a substrate.

138. **(original)** The reaction system of claim 27 wherein the pressure-partitioning subsystem comprises

a series of selectable sets of inlet flow restrictors, the series comprising (a) a first set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between at least one reactant source and first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the first set having a different flow resistance relative to each other, and (b) a second set of four or more inlet flow restrictors comprising first, second, third and fourth inlet flow restrictors providing fluid communication between the least one reactant source and the first, second, third and fourth reactors, respectively, each of the first, second, third and fourth inlet flow restrictors of the second set having a different flow resistance relative to each other, the flow resistance of at least one of the four or more inlet flow restrictors of the second set varying from the flow resistance of the corresponding inlet flow restrictor of the first set, such that the first set or the second set of inlet flow restrictors can be

selected to provide fluid communication between the at least one reactant source and the four or more reactors, and

a series of selectable sets of outlet flow restrictors, the series comprising (a) a first set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between first, second, third and fourth reactors, respectively, and at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the first set having a different flow resistance relative to each other, and (b) a second set of four or more outlet flow restrictors comprising first, second, third and fourth outlet flow restrictors providing fluid communication between the first, second, third and fourth reactors, respectively, an the at least one effluent sink, each of the first, second, third and fourth outlet flow restrictors of the second set having a different flow resistance relative to each other, the flow resistance of at least one of the four or more outlet flow restrictors of the second set varying from the flow resistance of the corresponding outlet flow restrictor of the first set, such that the first set or the second set of outlet flow restrictors can be selected to provide fluid communication between the four or more reactors and the at least one effluent sink.

139. **(original)** The reaction system of claim 138 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

140. **(original)** The reaction system of claim 138 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies mounted on a substrate.

141. **(currently amended)** The reaction system of claim 138 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with one or more microchip bodies detachably mounted on the substrate, and ;

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors are integral with one or more microchip bodies detachably mounted on the substrate.

142. **(original)** The reaction system of claim 118 wherein the flow-partitioning subsystem further comprises an inlet selection valve for selecting at least one the first set of inlet flow restrictors or the second set of inlet flow restrictors.

143. **(original)** The reaction system of claim 122 wherein the flow-partitioning subsystem further comprises an outlet selection valve for selecting at least one the first set of outlet flow restrictors or the second set of outlet flow restrictors.

144. **(original)** The reaction system of claim 126 wherein the flow-partitioning subsystem further comprises

an inlet selection valve for selecting at least one the first set of inlet flow restrictors or the second set of inlet flow restrictors, and

an outlet selection valve for selecting at least one the first set of outlet flow restrictors or the second set of outlet flow restrictors.

145. **(original)** The reaction system of claim 130 wherein the pressure-partitioning subsystem further comprises an inlet selection valve for selecting at least one the first set of inlet flow restrictors or the second set of inlet flow restrictors.

146. **(original)** The reaction system of claim 134 wherein the pressure-partitioning subsystem further comprises an outlet selection valve for selecting at least one the first set of outlet flow restrictors or the second set of outlet flow restrictors.

147. **(original)** The reaction system of claim 138 wherein the pressure-partitioning subsystem further comprises

an inlet selection valve for selecting at least one the first set of inlet flow restrictors or the second set of inlet flow restrictors, and

an outlet selection valve for selecting at least one the first set of outlet flow restrictors or the second set of outlet flow restrictors.

148. **(original)** The reaction system of claim 118 wherein the flow-partitioning subsystem further comprises a series of inlet isolation valves, the inlet-isolation-valve series comprising a first inlet isolation valve for selecting the first set of inlet flow restrictors, and a second inlet isolation valve for selecting the second set of inlet flow restrictors.

149. **(original)** The reaction system of claim 148 wherein the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

150. **(original)** The reaction system of claim 148 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

151. **(original)** The reaction system of claim 148 wherein

the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set array are integral with a substrate or with one or more microchip bodies mounted on a substrate.

152. **(original)** The reaction system of claim 122 wherein the flow-partitioning subsystem further comprises a series of outlet isolation valves, the outlet-isolation valve series comprising a first outlet isolation valve for selecting the first set of outlet flow restrictors, and a second outlet isolation valve for selecting the second set of outlet flow restrictors.

153. **(original)** The reaction system of claim 152 wherein the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

154. **(original)** The reaction system of claim 152 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

155. **(original)** The reaction system of claim 152 wherein

the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors are integral with a substrate or with one or microchip bodies mounted on a substrate.

156. **(original)** The reaction system of claim 126 wherein the flow-partitioning subsystem further comprises

a series of inlet isolation valves, the inlet-valve series comprising a first inlet isolation valve for selecting the first set of inlet flow restrictors, and a second inlet isolation valve for selecting the second set of inlet flow restrictors, and

a series of outlet isolation valves, the outlet-valve series comprising a first outlet isolation valve for selecting the first set of outlet flow restrictors, and a second outlet isolation valve for selecting the second set of outlet flow restrictors.

157. **(currently amended)** The reaction system of claim 156 wherein

the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

158. **(original)** The reaction system of claim 156 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

159. **(original)** The reaction system of claim 156 wherein

the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set array are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

160. **(original)** The reaction system of claim 130 wherein the pressure-partitioning subsystem further comprises a series of inlet isolation valves, the inlet-isolation valve series comprising a first inlet isolation valve for selecting the first set of inlet flow restrictors, and a second inlet isolation valve for selecting the second set of inlet flow restrictors.

161. **(original)** The reaction system of claim 160 wherein the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

162. **(original)** The reaction system of claim 160 wherein the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

163. **(original)** The reaction system of claim 160 wherein

the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set array are integral with a substrate or with one or more microchip bodies mounted on a substrate.

164. **(original)** The reaction system of claim 134 wherein the pressure-partitioning subsystem further comprises a series of outlet isolation valves, the outlet-valve series comprising a first outlet isolation valve for selecting the first set of outlet flow restrictors, and a second outlet isolation valve for selecting the second set of outlet flow restrictors.

165. **(original)** The reaction system of claim 164 wherein the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

166. **(original)** The reaction system of claim 164 wherein the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

167. **(original)** The reaction system of claim 164 wherein

the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

168. **(original)** The reaction system of claim 138 wherein the pressure-partitioning subsystem further comprises

a series of inlet isolation valves, the inlet-valve series comprising a first inlet isolation valve for selecting the first set of inlet flow restrictors, and a second inlet isolation valve for selecting the second set of inlet flow restrictors, and

a series of outlet isolation valves, the outlet-valve series comprising a first outlet isolation valve for selecting the first set of outlet flow restrictors, and a second outlet isolation valve for selecting the second set of outlet flow restrictors.

169. **(currently amended)** The reaction system of claim 168 wherein

the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

170. **(original)** The reaction system of claim 168 wherein

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

171. **(original)** The reaction system of claim 168 wherein

the first inlet isolation valve and the second inlet isolation valve of the inlet-isolation valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first outlet isolation valve and the second outlet isolation valve of the outlet-isolation-valve series are integral with a substrate or with one or more microchip bodies mounted on a substrate,

the first set of four or more inlet flow restrictors and the second set of four or more inlet flow restrictors of the inlet-set array are integral with a substrate or with one or more microchip bodies mounted on a substrate, and

the first set of four or more outlet flow restrictors and the second set of four or more outlet flow restrictors of the outlet-set series are integral with a substrate or with one or more microchip bodies mounted on a substrate.

172. **(original)** The reaction system of claims 1 or 2 further comprising a detection system for detecting at least one reaction product or unreacted reactant from the effluent discharged from each of the four or more reactors.

173. **(original)** The reaction system of claims 1 or 2 further comprising a parallel detection system for simultaneously detecting at least one reaction product or unreacted reactant from the effluent discharged from each of the four or more reactors.

174. **(original)** The reaction system of claims 1 or 2 further comprising a parallel gas chromatograph for simultaneously detecting at least one reaction product or unreacted reactant from the effluent discharged from each of the four or more reactors.

175. **(currently amended)** The reaction system of claim ~~claims~~ 1 wherein the reaction cavity of each of the four or more reactors has a volume of not more than about 10 ml.

176. **(original)** The reaction system of claim ~~claims~~ 1 wherein the reactors and fluid distribution system are adapted to effect a chemical reaction of interest at a temperature of not less than about 100 °C and additionally, or alternatively, at a pressure of not less than about 10 bar.

177. **(currently amended)** A method for evaluating a chemical reaction process, the method comprising

simultaneously supplying one or more reactants to each of four or more reactors under reaction conditions to effect a chemical reaction of interest, the one or more reactants being supplied through a fluid distribution system,

controllably varying a first set of reaction conditions between the four or more reactors, the first set of reaction conditions being selected from flow rate, pressure and feed composition, and

discharging a reactor effluent from each of the four or more reactors,

the fluid distribution system comprising one or more subsystems selected from the group consisting of

a flow-partitioning subsystem, the flow-partitioning subsystem comprising at least one set of four or more passive flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set,

a pressure-partitioning subsystem, the pressure-partitioning subsystem comprising at least one set of four or more passive flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set, and

a feed-composition subsystem, the feed-composition subsystem ~~one or more subsystems~~ comprising four or more mixing zones and at least one set of four or more passive flow restrictors, each of the four or more flow restrictors providing a resistance to flow between the one or more reactant sources and one of the four or more mixing zones, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set.

178. **(currently amended)** A method for evaluating a chemical reaction process, the method comprising

simultaneously supplying one or more reactants through a fluid distribution system to each of four or more reactors under reaction conditions to effect a chemical reaction of interest, each of the four or more reactors having a volume of not more than about 10 ml,

controllably varying a first set of reaction conditions between the four or more reactors, the first set of reaction conditions being selected from flow rate, pressure and feed composition, and

discharging a reactor effluent from each of the four or more reactors through the fluid distribution system,

the fluid distribution system comprising one or more subsystems selected from the group consisting of

a flow-partitioning subsystem having operational capability for providing a different flow rate to each of the four or more reactors, the flow-partitioning subsystem comprising at least one set of four or more flow restrictors integral with a substrate or with one or more microchip bodies mounted on a substrate,

a pressure-partitioning subsystem having operational capability for providing a different reaction pressure in the reaction cavity of each of the four or more reactors, the pressure-partitioning subsystem comprising at least one set of four or more flow restrictors integral with a substrate or with one or more microchip bodies mounted on a substrate, and

a feed-composition subsystem having operational capability for providing a different feed composition to each of the four or more reactors, the feed-composition subsystem comprising four or more mixing zones and at least one set of four or more flow restrictors, each of the four or more flow restrictors providing a resistance to flow between the one or more reactant sources and one of the four or more mixing zones, the four or more flow restrictors being integral with a substrate or with one or more microchip bodies mounted on a substrate.

179. **(original)** The method of claims 177 or 178 further comprising controlling a second set of reaction conditions to be substantially the same in each of the four or more reactors.

180. **(original)** The method of claims 177 or 178 further comprising

analyzing the reactor effluent from each of the four or more reactors to determine the conversion, selectivity or yield of the chemical reaction of interest, and

comparing the determined conversion, selectivity or yield for the reactions effected in each of the four or more reactors.

181. **(currently amended)** The method of claim ~~claims~~ 180 wherein the reactor effluent from each of the four or more reactors are simultaneously analyzed.

182. **(currently amended)** The method of claim ~~claims~~ 180 wherein the reactor effluent from each of the four or more reactors are simultaneously analyzed using gas chromatography or mass spectrometry.

183. **(currently amended)** The method of claim ~~claims~~ 180 wherein the reactor effluent from each of the four or more reactors are simultaneously analyzed using gas chromatography.

184. **(canceled).**

185. **(canceled).**

186. **(original)** A fluid distribution system for simultaneously providing a fluid to four or more cavities, each of the four or more cavities having an inlet providing fluid communication with at least one fluid source, and optionally, where the cavity is a flow cavity, an outlet providing fluid communication with at least one effluent sink, the fluid distribution comprising

one or more subsystems selected from the group consisting of (a) a flow-partitioning subsystem for providing a different flow rate to each of the four or more cavities, (b) a

pressure-partitioning subsystem for providing a different pressure in each of the four or more cavities, and (c) a feed-composition subsystem for providing a different feed composition to each of the four or more cavities, the one or more subsystems comprising at least one set of four or more flow restrictors, each of the four or more flow restrictors having a flow resistance that varies relative to other flow restrictors in the set, each of the four or more flow restrictors (i) being a capillary or (ii) being integral with a substrate or with one or more microchip bodies mounted on a substrate.

187. **(original)** The fluid distribution system of claim 186 wherein the four or more flow restrictors are integral with a substrate or with one or more microchip bodies mounted on a substrate.

188. **(original)** The fluid distribution system of claim 186 wherein the four or more flow restrictors are integral with a substrate or with one or more microchip bodies detachably mounted on a substrate.

189. **(original)** The fluid distribution system of claim 186 wherein the cavity is a flow cavity and comprises the outlet in fluid communication with the at least one effluent sink.

190. **(original)** The fluid distribution system of claim 186 wherein the cavity has a volume of not more than about 100 ml.

191. **(new)** A method for evaluating a chemical reaction process, the method comprising

simultaneously supplying one or more reactants to each of four or more reactors under reaction conditions to effect a chemical reaction of interest, the one or more reactants being supplied through a fluid distribution system,

controllably varying a set of reaction conditions between the four or more reactors, the varied set of reaction conditions including each of a varied flow rate, a varied pressure and a varied feed composition, in each case as compared between the four or more reactors, and

discharging a reactor effluent from each of the four or more reactors.

[NO FURTHER AMENDMENTS THIS PAGE]